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The Defense Logistics Agency (DLA) Directorate of Contracting requested DLA's Operations Research and Economic Analysis Office (DLA-LO) to formulate a management indicator which can provide visibility of the ability of the production base to meet surge and mobilization production needs. To this end, DLA-LO has developed, with the support of DLA's production readiness experts, a prototype indicator which may be used to aid in the selection of items for planning as part of the Industrial Preparedness Program (IPP). This report documents this indicator development effort.

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It is recommended in this study that development of the planning indicator be continued, to provide DLA's Supply Centers with a better methodology for the selection of items for participation in the IPP planning process and provide visibility of the responsiveness of the industrial base to meet emergency demands.

DLA INDUSTRIAL PREPAREDNESS PROGRAM (IPP)

ITEM SELECTION INDICATOR

DECEMBER 1987

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DEFENSE LOGISTICS AGENCY
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DLA-LO
4 April 1988

FOREWORD

The Defense Logistics Agency (DLA) Directorate of Contracting requested DLA's Operations Research and Economic Analysis Office (DLA-LO) to formulate a management indicator which can provide visibility of the ability of the production base to meet surge and mobilization production needs. To this end, DLA-LO has developed, with the support of DLA's production readiness experts, a prototype indicator which may be used to aid in the selection of items for planning as part of the Industrial Preparedness Program (IPP). This report documents this indicator development effort.

A prototype planning indicator has been developed which is based on the criticality of an item to its application and the uncertainty of availability for an item. Results from a test using the prototype indicator to evaluate the Construction, Electronics, General and Industrial commodities are presented. The prototype indicator shows much promise for identifying items which should be planned to ensure their availability during mobilization.

It is recommended in this study that development of the planning indicator be continued, to provide DLA's Supply Centers with a better methodology for the selection of items for participation in the IPP planning process and provide visibility of the responsiveness of the industrial base to meet emergency demands.

ROGER C. ROY
Assistant Director
Policy and Plans

CONTENTS

LIST OF TABLES

EXECUTIVE SUMMARY

The Defense Logistics Agency (DLA) performs industrial base mobilization planning as part of its Industrial Preparedness Program (IPP) to increase the likelihood that required materiel resources can be obtained from the industrial base during mobilization. DLA is currently limited to planning only a small percentage of the Services' War Reserve items because of planning resource limitations. Therefore, DLA must focus its planning efforts on those items which are critical to the mobilization effort and which planning can substantially reduce the uncertainty of their availability.

A multi-attribute indicator of the desirability of planning any item has been developed by the DLA Operations Research and Economic Analysis Office with the support of DLA's production readiness experts. The prototype indicator provides an overall relative "goodness" measure by considering six distinct item characteristics: application to the Commanders-in-Chief Critical Items List (CINC CIL) weapons systems, essentiality code, lead time, mobilization demand ratio, age of the item and mobilization demand value. These characteristics were selected because they represent the criticality of an item and its uncertainty of availability.

During the development of the indicator database, we found that there was minimal overlap between the War Reserve requirements submitted by the Services and the items which DLA manages which support the CINC CIL. There may be valid reasons for this disparity, but this issue should be investigated further to ensure that there is no major flaw in our planning process.

The planning indicator has been prototyped for the Construction, Electronics, General, and Industrial commodities to produce a rank-ordered list of candidate items for planning for each Center. Many of these candidate items would be excluded from planning consideration using current item selection criteria because the current approach does not consider that combinations of item characteristics may warrant planning. The prototype planning indicator appears to be a useful tool for aiding in the selection of items for industrial base planning.

We recommend the following:

- The apparent disparity between CINC CIL supporting items and Service War Reserve Requirements be investigated and resolved.

- The prototype indicator be modified to address the peculiarities of the Medical and Clothing & Textile commodities.

- The planning indicator be implemented at DLA's Supply Centers to provide an improved methodology for the selection of items for IPP planning.

I. INTRODUCTION

A major mission of the Defense Logistics Agency (DLA) is the management of several million consumable items which may be common to two or more of the Military Services. To ensure that items critical to national defense are available during periods of conflict, DLA uses its Industrial Preparedness Program (IPP) planning effort to develop mobilization plans with selected contractors for the production of critical materiel. Each year, the Services submit mobilization requirements for several hundred thousand items as part of their War Reserve program, however, based on limited resources only a small percentage is actually planned with industry. For this reason, it is critical that DLA focus its planning resources on those items with the greatest need.

IPP item planning consists of contractors developing time phased estimates of their mobilization production capabilities for selected items. IPP planning provides visibility of industry's expected mobilization production support and provides advance warning of possible mobilization requirements to selected contractors. This paper describes the process of developing an indicator for IPP item selection and the results from prototype testing.

II. METHODOLOGY

The DLA Operations Research and Economic Analysis Office has developed for DLA's Directorate of Contracting an indicator for identifying those items for which planning would be of greatest benefit. The indicator is based on a multi-attribute decision making technique known as TOPSIS (Technique for Order Preference by Similarity to Ideal Solution), which was developed by Yoon and Hwang at Kansas State University in 1980. (A similar approach is being utilized by the Joint Chiefs of Staff to prioritize weapon systems.) In this application of the TOPSIS methodology, item characteristics (attributes) have been chosen which represent either the criticality or the availability of an item. Items which are highly critical or have considerable uncertainty about their availability are the most logical candidates for planning given limited planning resources. These items will be further from the ideal combination of item characteristics and will therefore have a lower measure of relative closeness to the ideal solution using TOPSIS.

TOPSIS is a fairly simple technique to evaluate alternatives under a number of distinct criteria (attributes). It is relatively easy to rank various alternatives when desirability is measured in terms of a single characteristic. In general, at one end of the attribute value range is the most desirable value (ideal solution), and at the other end of the value range is the least desirable value (negative-ideal solution). Within this attribute value range, alternatives having attribute values closer to the ideal solution are better, while alternatives having values closer to the negative-ideal solution are worse. When additional characteristics are introduced against which alternative "goodness" is measured the issue becomes more complex. Multi-attribute decision making techniques have been developed for the purpose of ranking alternatives given multiple measurement criteria. TOPSIS is one such multi-attribute technique which allows the evaluation of alternatives when there are multiple attributes to be considered by providing a measure of the relative closeness of an alternative to the most desirable combination of

attributes. The details of this particular application of the TOPSIS methodology are described in the following sections.

III. ANALYSIS

A. Selection of Ranking Criteria. The motivation for planning items is primarily due to two factors: (1) the importance of particular items, and (2) the uncertainty of availability of items. Therefore, attributes which describe these item characteristics were chosen for inclusion in the planning indicator. A group of production readiness experts from DLA's Supply Centers was organized to identify these attributes. This group identified twelve attributes as being indicative of item criticality and availability during mobilization. These attributes are:

- o Critical Items List Application
- o Essentiality Code
- o Lead Time
- o Mobilization Demand Ratio
- o Size of Shortage
- o Get Well Date
- o Age of Item
- o Demand to Production Lag
- o Problem Industry
- o Number of Suppliers
- o Commercial Availability
- o Item Application

B. Indicator Prototyping. As a test of the indicator methodology, the model was to be prototyped using attributes which were readily available in automated databases. Since not all of the attributes chosen by the functional experts were available, only those available in an automated form were used. One additional attribute was introduced to bring the ranking criteria to six in number. The attributes (and their respective weights) selected for the prototyping of the indicator methodology are:

1. **CRITICAL ITEMS LIST APPLICATION** - (37.5). This was chosen as the most important attribute because of the emphasis on providing support to weapons on the Commanders-in-Chief Critical Items List (CINC CIL). The CINC CIL is a list of weapon systems which the various Commanders-in-Chief have designated as being critical to their war fighting capabilities. This attribute has "yes" and "no" as possible values. An item which has application to a CINC CIL weapon system is given the value "yes".

2. **ESSENTIALITY CODE** - (34.4)

The essentiality code represents the importance of an item to a weapon system. The valid essentiality codes and their definitions are:

a. 1 - Failure to this part will render end item inoperable

b. 3 - Failure to this part will not render end item inoperable

c. 5- Item does not qualify for code 1 but is needed for personnel safety

d. 6- Item does not qualify for code 1 but is needed for legal, climatic or other requirements peculiar to the planned operational environment of the end item

e. 7- Item does not qualify for code 1 but is needed to prevent impairment of or temporary reduction of operational effectiveness of the end item

f. Blank - Same as code 3 or appropriate service has not assigned an essentiality code

Since an item may have many different essentiality codes based upon particular applications, the highest essentiality code (representing greatest criticality of the item) was used. The ordering of the essentiality codes from highest to lowest criticality in this analysis was [1; 5 & 6 & 7; 3 & Blank]. A possible future enhancement to this methodology might be to compute a weighted essentiality code for each item based upon the magnitude of requirements for each application of the item and their corresponding essentiality codes.

3. **LEAD TIME** - (12.5). The lead time is the length of time required to produce an item (as represented by the production lead time). This attribute has been chosen because the greater the lead time, the slower the expected response to demands.

4. **MOBILIZATION DEMAND RATIO** - (9.4). This is the ratio of the mobilization demand requirements to normal peacetime demand. If this ratio is large, the potential for insufficient production base capabilities is greater.

5. **AGE OF ITEM** - (3.1). This attribute identifies whether the item is new or established. If the item is new to DLA (less than 2 years of management responsibility), there is less certainty of the availability of the item.

6. **MOBILIZATION DEMAND VALUE** - (3.1). The mobilization demand value is the dollar value of the projected mobilization demand (the Other War Reserve Materiel Requirements). Although this attribute was not among the original twelve selected by the production readiness experts, it was included because it was readily available and a large mobilization demand value could indicate insufficient industrial base capabilities.

C. Items Examined

The population of items to be evaluated was developed from two sources. Service War Reserve items, which have been traditionally considered for planning, were merged with items supporting the CINC CIL. Table 1 displays the breakout of items examined by commodity. The development of the indicator database is described in greater detail in Appendix A.

It is interesting to note the general lack of overlap (common items) between the items which DLA manages which support the CINC CIL and the items for which War Reserve requirements are submitted by the Services. Overall, there is less than a ten percent overlap of these two item populations. The discovery of this lack of correlation between the items which the CINC's identify as critical to their mission during mobilization, and the mobilization requirements submitted by the Services as part of the War Reserve program may warrant review of the Services War Reserve computations.

Table 1

INDICATOR DATABASE BREAKDOWN

Commodity	CIL Items	WRMR Items	Unique Items	Common Items
Construction	17,661	29,276	43,772	3,165
Electronic	59,812	43,414	92,794	10,432
General	13,337	17,171	27,848	2,660
Industrial	66,582	67,379	121,781	12,180
Medical	52	11,138	11,164	26
Textile	123	3,047	3,102	68
Total	157,567	171,425	300,461	28,531

D. Indicator Computation

Computation of the indicator value for each item is a relatively simple process. The following briefly describes the indicator computation process:

1. Definition of ideal and negative-ideal values - Rather than specifying a "high" or "low" value for these values as typical to a simple TOPSIS application, distinct values were identified for both the ideal and negative-ideal solutions. This was done to limit the influence of items with extreme attribute values. For the prototype indicator effort, the following values were assigned as the ideal and negative-ideal solutions:

	IDEAL	NEG-IDEAL
CIL Application	No	Yes
Essentiality Code	Blank	1
Lead Time	0 days	750 days
Mob Demand Ratio	0	500
Age of Item	Estab.	New
Mob Demand Value	$ 0	$ 100,000

2. Assignment of attribute values - Each item was assigned a numeric score for each attribute. Attributes with non-numeric or non-cardinal values were assigned cardinal values. Attribute values for the CIL application, essentiality code and age of item code were assigned as follows:

CIL Application -

No	--->	0.0
Yes	--->	1.0

Essentiality Code -

1	--->	0.0
3	--->	5.5
5	--->	3.5
6	--->	3.5
7	--->	3.5
Blank	--->	5.5

Age of Item Code -

E	--->	1.0
N	--->	2.0
Blank	--->	1.5

3. Clipping of extreme values - Items which had attribute values beyond the bounds of the ideal or negative-ideal values had their values clipped to within these limits.

4. Normalization of attributes - Each of the attributes was normalized to produce an attribute value range of 0 to 1.

5. Application of attribute weights - The normalized attribute vectors were multiplied by the appropriate weighting factors.

6. Computation of distance measures - The Euclidean distances for item state space coordinates to both the ideal and negative-ideal solutions were computed.

7. Computation of indicator value - The relative closeness of each item to the ideal solution was computed by dividing the distance to the negative-ideal by the sum of the distances to the ideal and negative-ideal solutions. This result was subtracted from one to produce an indicator where a higher value (closer to 1.00) represents a greater need for planning.

8. Rank ordering the items - The items were sorted by their indicator value in descending order. This produced a list of candidate items for planning where again, higher indicator scores represented a greater need for industrial base planning.

Appendix B describes the indicator computation process in greater detail and includes listings of the programs developed for indicator value computation. Appendix C provides a step by step example of the indicator computation process for a sample item.

E. Indicator Adjustments. The indicator computation can be fine tuned using various "knobs" inherent to the technique. The two most significant ways to adjust the indicator are (1) through the definition of the ideal and negative-ideal solutions, and (2) by the assignment of the relative attribute weights. During the prototype indicator review process, each of these "knobs" was adjusted to produce results that were in closer agreement with the opinion of DLA's production readiness experts.

IV. FINDINGS

It is useful to examine a sample of the prototype indicator's output. Table 2 displays a typical listing of indicator results. The first column labeled "NSN" is the National Stock Number for the item. The second column is labeled "ITEM NAME" and indicates the nomenclature for the item. The third column labeled "PLAN CODE" shows whether the item was planned during the last IPP cycle. A "P" in this column indicates that the item was planned. (Currently this field is only valid for the General commodity.) The fourth column is labeled "INDCTR VALUE" and represents the indicator value which was computed for the item from its attribute values. The list is ordered based on this column, with high values, which indicate a greater need for planning, appearing at the top of the list. The fifth column is labeled "CIL CODE" and has the code "C" if the item is used on a CIL weapon system, and blank otherwise. The sixth column, labeled "ESS CODE", represents the highest essentiality code for any application of that item to a weapon system. The seventh column, "LEAD TIME", is the production lead time for the item. The eighth column, "MOB DMD RATIO", is the mobilization demand ratio for the item. The ninth column, "MOB DEMAND VALUE", is the mobilization demand value for the item expressed in dollars. The tenth and final column is labeled "AGE OF ITEM" and represents the age of item code for the item, where "E" means "established" and "N" means "new". This output listing was designed to display much of the information used for the indicator computation as well as the planning indicator value itself so that the listing might be more useful as a planning tool to production readiness personnel. By displaying this additional information, more informed decisions can be made when selecting items for planning.

The prototype indicator appears to produce results which can be useful in the planning process for DLA's four hardware centers. Results for the top 100 items for each of the hardware centers are presented in Appendices D through G. It appears that the prototype indicator in its present configuration does not address the peculiarities of the items managed by Defense Personnel Support Center (the Medical and Clothing & Textile commodities). An indicator using attributes which are not as weapon system related as those for the hardware centers' indicator would be more appropriate for DPSC.

The approach of a multi-attribute indicator to determine which items should be considered for planning appears to have some advantages over the current method of using independent screening criteria to identify items for planning. The current screening criteria limits planning consideration to items meeting each of the following three criteria:

Table 2

SAMPLE PROTOTYPE INDICATOR OUTPUT LISTING

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IPP PROTOTYPE INDICATOR RESULTS
*** DGSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	CSS CODE	LEAD TIME	MOB PND RATIO	MOB DEMAND VALUE	AGE OF ITEM
6680010826788	TRANSMITTER,LIQUID		.8821	C	1	513	245.5	180830	E
1055011068601	FILTER ASSEMBLY		.8420	C	1	680	17.0	68255	E
6680005738137	TRANSMITTER,LIQUID		.8421	C	1	818	4.1	82734	E
5975006026684	COUPLING,ELECTRICAL		.8396	C	1	683	25.6	4196	E
5940004454755	TERMINAL BOARD		.8388	C	1	209	611.0	6159	E
6680005738139	TRANSMITTER,LIQUID		.8375	C	1	610	6.8	76218	E
5940001771975	TERMINAL,TAPER PIN,		.8368	C	1	171	3896.0	1052	N
6615011585747	LINK ASSEMBLY		.8359	C	1	573	11.8	68971	E
6150003284502	LEAD,ELECTRICAL		.8356	C	1	249	305.5	489	E
6680000586678	INDICATOR,LIQUID QU		.8350	C	1	595	1.8	65177	E
6105011140144	MOTOR,DIRECT CURREN		.8343	C	1	389	91.0	271778	E
6620008303554	TRANSMITTER,PRESSUR		.8291	C	1	520	.9	82806	E
6680011233237	TRANSMITTER,LIQUID		.8282	C	1	511	1.3	133258	E
6350010500265	ANNUNCIATOR		.8269	C	1	583	.6	3706	E
9330001139438	PLASTIC SHEET		.8273	C	1	480	1.8	113021	E
5940002571263	TERMINAL,LUG		.8259	C	1	195	251.9	119882	E
6680011672962	TRANSMITTER,LIQUID		.8254	C	1	530	.7	7203	E
6680011668880	TRANSMITTER,LIQUID		.8237	C	1	518	.9	1751	E
5995010955279	CABLE ASSEMBLY,SPEC		.8230	C	1	450	.2	105996	E
6685011272589	SENSOR,TEMPERATURE		.8225	C	1	500	.1	5700	E
5975011014075	JUNCTION BOX,ASSEMB		.8221	C	1	450	8.0	2457	E
6680011382975	TRANSMITTER,LIQUID		.8220	C	1	500	0.0	1214	E
6130010391875	POWER SUPPLY	P	.8211	C	1	473	8.5	5988	E
9320011579070	RUBBER SHEET,SOLID		.8207	C	1	278	142.0	6569	E
5940009836125	TERMINAL BOARD		.8187	C	1	450	8.0	23	E

1. Lead time greater than 60 days

2. Other War Reserve Materiel Requirement greater than $10,000

3. Mobilization demand ratio greater than 3.0

Failure to satisfy one of the criteria removes an item from planning consideration regardless of how the item rates against the other criteria. The new indicator has the advantage that it considers the combination of attribute values to identify candidate items. Weakness in one attribute may be offset by strength in another attribute. Elimination of independent screening criteria will allow the combined effects of the various criteria to be addressed.

The multi-attribute approach also has the advantage of allowing varying degrees of emphasis to be placed on each of the attributes by means of the attribute weighting process. If much greater emphasis on a particular attribute is desired during a given planning cycle, a greater weight can be assigned to that attribute prior to the indicator computation process. The results of the new weight will be reflected in the indicator results.

V. CONCLUSIONS

The development of the planning indicator item database has revealed that very little overlap exists between the items for which the Services submit War Reserve requirements and the DLA managed items which support CINC CIL weapons systems. Although these two lists were developed by different groups and for different purposes -- the CINC CIL by the operations planners for ensuring war fighting capabilities, and the War Reserves by the logistics planners for ensuring logistics sustainability -- one would expect a greater overlap in these items than the ten percent that is observed. Possibly, the War Reserve requirements are computed solely on the basis of reliability failures, and do not include any combat damage requirements. Therefore, some disparity between the item populations may exist as some items will not need to be replaced except in the event of combat damage. Nonetheless, the lack of War Reserve requirements for many of the critical items which support the CINC CIL should be reconciled.

This prototyping effort has demonstrated that it is feasible to construct an indicator which is useful in identifying candidate items for industrial base mobilization planning. Ranking items based on item characteristics which indicate item criticality and uncertainty of availability can be a useful method for selecting items for planning. Given the scarcity of production planning resources, planning efforts should focus on those items with the greatest payback from planning -- where the planning will insure the availability of items critical to mobilization efforts. The indicator can also be a useful tool for identifying areas of the industrial base which may warrant further examination. For instance, computing an indicator value across a supply class (averaging the item indicator values for items within a supply class) may reveal potential weaknesses in specific areas of the industrial base. These results might be used to direct studies of weak sectors within the industrial base.

VI. RECOMMENDATIONS

The following recommendations are made:

o Investigate the reasons for the disparity between the Services' War Reserve requirements and the CINC CIL supporting items. This can be an opportunity to ensure that the operations planners are communicating with the logistics planners.

o Develop prototype indicators for the Medical and Clothing & Textile commodities considering the unique characteristics of each of these commodities.

o Implement the multi-attribute planning indicator methodology as part of the JPP planning process. The methodology should be adapted for use at the Supply Center level. The Directorate of Contracting, DLA Headquarters, should maintain oversight of the application of indicator software at the DLA Supply Centers. (This implementation of the planning indicator may entail developing programs for use on Center mainframe computers (Standard Automated Materiel Management System - SAMMS), minicomputers (Distributed Minicomputer Processing System - DMINS), or microcomputers.)

APPENDIX A - DATABASE DEVELOPMENT

Development of the indicator databases for each of the different commodities examined was accomplished using the following procedure.

(1) Identification of the CINC CIL related items. The first step in identifying the DLA managed items which are related to the CINC CIL required relating Weapon System Designator Codes (WSDC's) to as many of the CINC CIL systems as possible. After the appropriate WSDC's were identified, a list of DLA managed items for all of the CINC CIL related WSDC's was obtained using information contained in the DLA Integrated Data Base (DIDB).

(2) CINC CIL item data expansion. Additional item information (such as lead time, mobilization demand, etc.) required to compute the indicator values was obtained from different files within the DIDB and added to the CINC CIL item database.

(3) Identification of War Reserve items. War Reserve items were identified as those items with an Other War Reserve Materiel Requirement (OWRMR) of greater than zero. In addition to the NSN, much of the data required for indicator computation was pulled at the same time because it was available in the same DIDB files.

(4) War Reserve item data expansion. The essentiality code as obtained from the weapon system file of the DIDB was added to the War Reserve item database.

(5) Merging of the item databases. The CINC CIL item database was merged with the War Reserve item database to produce one combined database. A field indicating the source of each item (CINC CIL, War Reserve, or both) was also added to the data.

(6) Adjustment of essentiality code field. The essentiality code representing the application of highest criticality was used as the essentiality code for each item.

(7) Conversion of data fields to numeric attribute data. Those fields which were either non-numeric or non-cardinal were converted to numeric values. Other indicator attributes which were a combination of item data fields (such as mobilization demand value which is the unit price times the mobilization demand quantity) were also computed.

(8) Addition of planning field. For the General commodity, information was obtained which indicated which items had been planned during the previous planning cycle. This information was appended to the indicator attribute database.

These steps comprise the indicator database development process. The resulting database was used for indicator value computation.

APPENDIX B - INDICATOR COMPUTATION PROGRAM

1. Indicator Computation

A fairly simple FORTRAN 77 program was used to compute the indicator values for each item. This program is composed of the following four modules:

MAIN - The main program calls the various subroutines.

RDSOLN - This routine reads the attribute names, weights, and the ideal and negative-ideal solutions.

PROCSS - This routine computes the normalization factors for each of the attributes.

COMPUT - This routine performs the actual computation of the relative closeness to the ideal solution.

2. Output Report Generation

The output listings were produced by using the report capabilities of the Statistical Package for the Social Sciences (SPSS). The remaining pages of this appendix represent a listing of the source code of the indicator computation program and the SPSS statements used to produce the output reports.

```
LEVEL 1.3.0 (MAY 1983)          VS FORTRAN          DATE: NOV 02, 1987    TIME: 10:51:49                    PAGE:    1

REQUESTED OPTIONS (EXECUTE): NODECK,NOLIST,OPT(O),NOTF

OPTIONS IN EFFECT:  NOLIST NOMAP NOXREF NOGOSTMT NODECK   SOURCE   TERM   OBJECT FIXED  NOTEST NOTRMFLG   SRCFLG NOSYM
                      OPT(O) LANGLVL(77) NOFIPS   FLAG(I)  NAME(MAIN  ) LINECOUNT(60)      CHARLEN(500)     SDUMP

                  *....*...1.....2.....3.....4.....5.....6.....7.*.....8

                  C   PROGRAM TO COMPUTE MULTI-ATTRIBUTE INDICATOR                          00001000
                  C   USING TOPSIS APPROACH                                               00002000
                  C                                                                        00003000
                  C    PROGRAM VARIABLES                                                   00004000
                  C                                                                        00005000
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                  C      IDEAL(6)   = IDEAL SOLN ARRAY                                     00007000
                  C      NIDEAL(6)  = NEGATIVE-IDEAL SOLN ARRAY                            00008000
                  C      WGT(6)     = RELATIVE WEIGHT ARRAY                                00009000
                  C      SUMSQ(6)   = SUMS OF SQUARES ARRAY                                00009100
                  C      IDFILE     = FILE CONTAINING INDICATOR DESIGN                     00009200
                  C      INFILE     = INDICATOR DATABASE FILE                              00009300
                  C      OTFILE     = OUTPUT FILE                                          00009400
                  C                                                                        00009500
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ISN         3           INTEGER COUNTR,IDFILE,INFILE,OTFILE,ATTR                         00030000
                  C                                                                        00040000
ISN         4           DATA COUNTR/0/                                                   00050000
ISN         5           DATA IDFILE/2/                                                   00060000
ISN         6           DATA INFILE/3/                                                   00070000
ISN         7           DATA OTFILE/8/                                                   00080000
                  C                                                                        00091000
                  C   READ INDICATOR DESIGN PARAMETERS                                   00092000
                  C                                                                        00093000
ISN         8           OPEN(IDFILE,STATUS='OLD')                                        00100000
ISN         9           CALL RDSOLN(IDFILE,IDEAL,NIDEAL,WGT,LABEL)                       00110000
ISN        10           CLOSE(IDFILE)                                                    00120000
                  C                                                                        00121000
                  C   COMPUTE SUMS OF SQUARES FOR EACH ATTRIBUTE                          00122000
                  C                                                                        00123000
ISN        11           OPEN(INFILE,STATUS='OLD')                                        00130000
ISN        12           CALL PROCSS(INFILE,IDEAL,NIDEAL,SUMSQ,LOW)                       00140000
                  C                                                                        00141000
                  C   COMPUTE INDICATOR VALUE FOR EACH ITEM                             00142000
                  C                                                                        00143000
ISN        13           REWIND(INFILE)                                                   00150000
ISN        14           OPEN(OTFILE,STATUS='NEW')                                        00160000
ISN        15           CALL COMPUT(INFILE,OTFILE,IDEAL,NIDEAL,SUMSQ,WGT,COUNTR,LABEL,LOW)00170000
ISN        16           CLOSE(INFILE)                                                    00180000
ISN        17           CLOSE(OTFILE)                                                    00190000
ISN        18           STOP                                                             00200000
ISN        19           END                                                              00210000

*STATISTICS*   SOURCE STATEMENTS = 19, PROGRAM SIZE = 1352 BYTES, PROGRAM NAME = MAIN     PAGE:

*STATISTICS*     NO DIAGNOSTICS GENERATED.

*****  END OF COMPILATION 1  *****
```

```
LEVEL 1.3.0 (MAY 1983)          VS FORTRAN          DATE: NOV 02, 1987    TIME: 10:51:49                    PAGE:    2

OPTIONS IN EFFECT:  NOLIST NOMAP NOXREF NOGOSTMT NODECK   SOURCE   TERM   OBJECT FIXED  NOTEST NOTRMFLG   SRCFLG NOSYM
                      OPT(0) LANGLVL(77) NOFIPS   FLAG(I)  NAME(MAIN  )  LINECOUNT(60)      CHARLEN(500)     SDUMP

                 *....*...1.....2.....3.....4.....5.....6.....7.*.....8

ISN         1          SUBROUTINE RDSOLN(IDFILE,IDEAL,NIDEAL,WGT,LABEL)                    00220000
                  C                                                                        00221000
                  C   ROUTINE TO READ THE INDICATOR DESIGN PARAMETERS                      00222000
                  C                                                                        00223000
ISN         2          INTEGER IDFILE                                                      00230000
ISN         3          REAL IDEAL(6),NIDEAL(6),WGT(6)                                      00240000
ISN         4          CHARACTER*20 LABEL(6)                                               00250000
                  C                                                                        00251000
ISN         5          DO 10 I=1,6                                                         00260000
ISN         6             READ(IDFILE,100,END=99) LABEL(I),WGT(I),IDEAL(I),NIDEAL(I)       00270000
ISN         7      100    FORMAT(A20,F12.2,F12.2,F12.2)                                    00280000
ISN         8             WRITE(6,200) I,LABEL(I),WGT(I),IDEAL(I),NIDEAL(I)                00290000
ISN         9      200    FORMAT('0',' ATTRIBUTE NO. ',I1,' = ',A20,3X,'WGT = ',F12.2,     00300000
                     +           ' IDEAL = ',F12.2,' NEG-IDEAL = ',F12.2)                  00310000
ISN        10       10 CONTINUE                                                           00320000
ISN        11       99 RETURN                                                             00330000
ISN        12          END                                                                00340000

*STATISTICS*   SOURCE STATEMENTS = 12, PROGRAM SIZE = 1096 BYTES, PROGRAM NAME = RDSOLN     PAGE:    2.

*STATISTICS*   NO DIAGNOSTICS GENERATED.

****** END OF COMPILATION 2 ******
```

```
OPTIONS IN EFFECT:  NOLIST NOMAP NOXREF NOGOSTMT NODECK   SOURCE   TERM   OBJECT FIXED  NOTEST NOTRMFLG   SRCFLG NOSYM
                      OPT(0) LANGLVL(77) NOFIPS   FLAG(I)  NAME(MAIN  ) LINECOUNT(60)      CHARLEN(500)     SDUMP

                *....*....1....+....2....+....3....+....4....+....5....+....6....+....7.*....+....8

ISN         1           SUBROUTINE PROCSS(INFILE,IDEAL,NIDEAL,SUMSQ,LOW)                    00350000
                                                                                            00351000
                C
                C   ROUTINE TO COMPUTE THE SUMS OF SQUARES REQUIRED FOR                    00352000
                C   DECISION MATRIX NORMALIZATION                                          00353000
                C                                                                           00354000
ISN         2           INTEGER INFILE,COUNTR                                               00360000
ISN         3           REAL IDEAL(6),NIDEAL(6),SUMSQ(6),LOW(6)                             00370000
                                                                                            00380000
                C                                                                           00401000
                C                                                                           00402000
                C   SET NORMALIZATION FACTORS (SUMSQ)                                      00403000
                C                                                                           00410000
ISN         4           DO 10 J=1,6                                                         00420000
ISN         5              LOW(J)=MIN(IDEAL(J),NIDEAL(J))                                   00430000
ISN         6              IF(LOW(J).NE.0) THEN                                             00440000
ISN         7                 IDEAL(J)=IDEAL(J)-LOW(J)                                      00450000
ISN         8                 NIDEAL(J)=NIDEAL(J)-LOW(J)                                    00460000
ISN         9              ENDIF                                                            00470000
ISN        10              SUMSQ(J)=ABS(IDEAL(J)-NIDEAL(J))                                 00520000
ISN        11          10 CONTINUE                                                         00590000
ISN        12           RETURN                                                             00600000
ISN        13           END

*STATISTICS*   SOURCE STATEMENTS = 13, PROGRAM SIZE = 1120 BYTES, PROGRAM NAME = PROCSS    PAGE:   3.

*STATISTICS*    NO DIAGNOSTICS GENERATED.

****** END OF COMPILATION 3 ******
```

OPTIONS IN EFFECT: NOLIST NOMAP NOXREF NOGOSTMT NODECK SOURCE TERM OBJECT FIXED NOTEST NOTRMFLG SRCFLG NOSYM
OPT(0) LANGLVL(77) NOFIPS FLAG(I) NAME(MAIN) LINECOUNT(60) CHARLEN(500) SDUMP

```
                *....*...1.....2.....3.....4.....5.....6.....7.*.....8
ISN        1          SUBROUTINE COMPUT(INFILE,OTFILE,IDEAL,NIDEAL,SUMSQ,WGT,COUNTR,     00610000
                     +                  LABEL,LOW)                                      00620000
                                                                                        00621000
                C                                                                       00622000
                C   ROUTINE TO COMPUTE RELATIVE CLOSENESS MEASURE (INDICATOR VALUE)     00623000
                C                                                                       00630000
ISN        2          CHARACTER LABEL(6)*20,NSN*13,ITNAME*19,CODE*1,AGE*1,PLAN*1       00631000
ISN        3          CHARACTER CIL*1                                                  00640000
ISN        4          INTEGER INFILE,OTFILE,COUNTR,ESSCD                               00650000
ISN        5          REAL IDEAL(6),NIDEAL(6),SUMSQ(6),WGT(6),SUMPOS,SUMNEG,DIST       00660000
ISN        6          REAL VALUE(6),IDL(6),NIDL(6),HOLD(6),LOW(6)                      00670000
                C                                                                       00680000
                C   NORMALIZE IDEAL AND NEG-IDEAL SOLNS AND APPLY ATTR WEIGHTS         00681000
                C                                                                       00720000
ISN        7          DO 15 J=1,6                                                      00730000
ISN        8             IF(SUMSQ(J).NE.0.0) THEN                                      00740000
ISN        9                IDL(J)=WGT(J)*IDEAL(J)/SUMSQ(J)                            00750000
ISN       10                NIDL(J)=WGT(J)*NIDEAL(J)/SUMSQ(J)                          00760000
ISN       11             ELSE                                                          00770000
ISN       12                IDL(J)=WGT(J)*IDEAL(J)                                     00780000
ISN       13                NIDL(J)=WGT(J)*NIDEAL(J)                                   00790000
ISN       14             ENDIF                                                         00800000
ISN       15       15 CONTINUE                                                        00801000
                C                                                                       00802000
                C   READ AN ITEM                                                       00803000
                C                                                                       00810000
ISN       16          1 READ(INFILE,100,END=99) NSN,CODE,(VALUE(I),I=1,6),ESSCD,ITNAME, 00820000
                     +AGE,PLAN,CIL                                                      00830000
ISN       17       100 FORMAT(A13,A1,6F12.2,I1,A19,A1,A1,A1)                          00840000
ISN       18          DO 3 I=1,6                                                      00850000
ISN       19             HOLD(I)=VALUE(I)                                             00851000
ISN       20             IF(LOW(I).NE.0) THEN                                         00852000
ISN       21                VALUE(I)=VALUE(I)-LOW(I)                                  00853000
ISN       22             ENDIF                                                        00860000
ISN       23        3 CONTINUE                                                       00861000
                C                                                                       00862000
                C   CLIP EXTREME VALUES                                               00863000
                C                                                                       00870000
ISN       24          DO 5 J=1,6                                                      00880000
ISN       25             IF(IDEAL(J).GT.NIDEAL(J)) THEN                               00890000
ISN       26                IF(VALUE(J).GT.IDEAL(J)) VALUE(J)=IDEAL(J)                00900000
ISN       28                IF(VALUE(J).LT.NIDEAL(J)) VALUE(J)=NIDEAL(J)              00910000
ISN       30             ELSE IF(IDEAL(J).LT.NIDEAL(J)) THEN                          00920000
ISN       31                IF(VALUE(J).GT.NIDEAL(J)) VALUE(J)=NIDEAL(J)              00930000
ISN       33                IF(VALUE(J).LT.IDEAL(J)) VALUE(J)=IDEAL(J)                00940000
ISN       35             ELSE                                                         00950000
ISN       36                VALUE(J)=IDEAL(J)                                         00960000
ISN       37             ENDIF                                                        00970000
ISN       38        5 CONTINUE                                                       00980000
ISN       39          SUMPOS=0.0                                                     00990000
ISN       40          SUMNEG=0.0                                                     01000000
ISN       41          DIST=0.0                                                       01001000
                C                                                                       01002000
                C   NORMALIZE AND APPLY WEIGHTS
```

```
                *....*...1.....2.....3.....4.....5.....6.....7.*..... .8
                C                                                                01003000
ISN       42          DO 20 J=1,6                                                01010000
ISN       43             IF(SUMSQ(J).NE.0.0) THEN                                01020000
ISN       44                VALUE(J)=VALUE(J)/SUMSQ(J)                           01030000
ISN       45             ENDIF                                                   01040000
ISN       46             VALUE(J)=VALUE(J)*WGT(J)                                01050000
ISN       47       20 CONTINUE                                                   01060000
                C                                                                01061000
                C   COMPUTE DISTANCES TO IDEAL AND NEG-IDEAL SOLNS FOR ITEM     01062000
                C                                                                01063000
ISN       48          DO 30 I=1,6                                                01070000
ISN       49             SUMPOS=SUMPOS+(VALUE(I)-IDL(I))**2                      01080000
ISN       50             SUMNEG=SUMNEG+(VALUE(I)-NIDL(I))**2                     01090000
ISN       51       30 CONTINUE                                                   01100000
ISN       52          SUMPOS=SUMPOS**(0.5)                                       01110000
ISN       53          SUMNEG=SUMNEG**(0.5)                                       01120000
                C                                                                01121000
                C   COMPUTE RELATIVE CLOSENESS TO IDEAL (INDICATOR VALUE)       01122000
                C                                                                01123000
ISN       54          DIST=SUMNEG/(SUMPOS+SUMNEG)                                01130000
                C                                                                01130200
                C   INVERT CLOSENESS MEASURE SO THAT HIGH VALUE IS BAD           01130300
                C                                                                01130400
ISN       55          DIST=1.0-DIST                                              01130500
                C                                                                01131000
                C   WRITE OUTPUT FILE                                            01132000
                C                                                                01133000
ISN       56          WRITE(OTFILE,200) NSN,CODE,DIST,(HOLD(J),J=1,6),ESSCD,ITNAME,AGE,  01140000
                     +PLAN,CIL                                                   01141000
ISN       57       200 FORMAT(' ',A13,2X,A1,2X,F6.4,6(2X,F12.1),I1,A19,A1,A1,A1)  01150000
                C                                                                01151000
                C   PROCESS NEXT ITEM                                           01152000
                C                                                                01153000
ISN       58          GOTO 1                                                     01160000
                C                                                                01161000
                C   ALL ITEMS PROCESSED - RETURN TO MAIN PROGRAM                 01162000
                C                                                                01163000
ISN       59       99 RETURN                                                     01170000
ISN       60          END                                                        01180000

*STATISTICS*   SOURCE STATEMENTS = 56, PROGRAM SIZE = 4350 BYTES, PROGRAM NAME = COMPUT    PAGE:    4.

*STATISTICS*    NO DIAGNOSTICS GENERATED.

****** END OF COMPILATION 4 ******
```

```
06 NOV 87    SPSS-X RELEASE 2.1  FOR IBM OS & MVS
13:32:33     DEFENSE GENERAL SUPPLY CENTER  IPL 4446          OS/VS2 MVS


 SSSSSSS   PPPPPPPP   SSSSSSS   SSSSSSS     XX     XX       2222222       1
SSSSSSSSS  PPPPPPPPP SSSSSSSSS SSSSSSSSS    XX     XX      222222222     11
SS     SS  PP     PP SS     SS SS     SS     XX   XX       22     22    111
SS         PP     PP SS        SS             XX XX             22      11
SSSSSSSS   PPPPPPPPP SSSSSSSS  SSSSSSSS ===    XXX             22       11
 SSSSSSSS  PPPPPPPP   SSSSSSSS  SSSSSSSS ===    XXX            22        11
       SS  PP               SS        SS      XX XX          22         11
SS     SS  PP         SS     SS SS     SS     XX   XX       22          11
SSSSSSSSS  PP         SSSSSSSSS SSSSSSSSS    XX     XX   22222222 .. 1111
 SSSSSSS   PP          SSSSSSS   SSSSSSS     XX     XX   222222222 .. 1111

FOR OS/VS2 MVS          DEFENSE GENERAL SUPPLY CENTER      LICENSE NUMBER 1330

USE THE COMMAND:  INFO OVERVIEW FACILITIES FOR MORE INFORMATION ON:

* READING SAS AND OSIRIS DATASETS       * TIME AND DATE FORMATS AND FUNCTIONS
* ALSCAL:  MULTIDIMENSIONAL SCALING     * UPDATE TRANSACTIONS TO SYSTEM FILES
* USERGET:  USERPROC-LIKE INTERFACE      * EXPORT FOR DATA COMMUNICATIONS
  TO CREATE ACTIVE FILES                 * MULTIPUNCHED DATA AND BIT FIELDS
* RECOMPILING OLD USERPROC ROUTINES      * SIMPLIFIED REGRESSION COMMAND

   1  0 01420007 TITLE  IPP INDICATOR RESULTS
   2  0 00010607 DATA LIST FILE=INDATA FIXED RECORDS=1/
   3  0 00010707  NSN 2-14 (A) CODE 17 (A) IND 20-25 SRCX 28-39 ESCDX 42-53 LDTM 56-67
   4  0 00010807  MDR 70-81 DMDVAL 84-95 AGECOD 98-109 ESSCD 110 NAME 111-129 (A)
   5  0 00010907  AGE 130 (A) PLAN 131 (A) SRC 132 (A)

THE ABOVE DATA LIST STATEMENT WILL READ   1 RECORDS FROM FILE INDATA   .

          VARIABLE   REC  START    END          FORMAT  WIDTH  DEC

          NSN          1      2     14          A          13
          CODE         1     17     17          A           1
          IND          1     20     25          F           6    0
          SRCX         1     28     39          F          12    0
          ESCDX        1     42     53          F          12    0
          LDTM         1     56     67          F          12    0
          MDR          1     70     81          F          12    0
          DMDVAL       1     84     95          F          12    0
          AGECOD       1     98    109          F          12    0
          ESSCD        1    110    110          F           1    0
          NAME         1    111    129          A          19
          AGE          1    130    130          A           1
          PLAN         1    131    131          A           1
          SRC          1    132    132          A           1

END OF DATALIST TABLE.

   6  0 00011007 STRING FSC (A4)
   7  0 00011207 COMPUTE FSC = SUBSTR(NSN,1,4)
   8  0 01470007 PRINT FORMATS IND (F6.4) MDR (F5.1)
   9  0 01480007 SORT CASES BY IND (D)

SIZE OF FILE TO BE SORTED:       200 CASES OF     144 BYTES EACH.
```

06 NOV 87 IPP INDICATOR RESULTS
13:32:37 DEFENSE GENERAL SUPPLY CENTER IPL 4446 OS/VS2 MVS

SORT COMPLETED SUCCESSFULLY. FILE SIZE: 23198 BYTES.
MEMORY AVAILABLE: 518826 BYTES.

06 NOV 87 IPP INDICATOR RESULTS
13:32:40 DEFENSE GENERAL SUPPLY CENTER IPL 4446 OS/VS2 MVS

PRECEDING TASK REQUIRED 0.30 SECONDS CPU TIME; 4.03 SECONDS ELAPSED.

```
  10  O 01490007 REPORT FORMAT=LIST(1) MARGINS(1,132) LENGTH(1,57) BRKSPACE(-1)/
  11  O 01500007       VARIABLES=NSN(13) ' ' 'NSN'
  12  O 01510007                 NAME(21) ' ' 'ITEM NAME'
  13  O 01530007                 PLAN(4) 'PLAN' 'CODE'
  14  O 01540007                 IND(6) 'INDCTR' 'VALUE'
  15  O                          SRC(4) 'SRC' 'CODE'
  16  O 01550007                 ESSCD(4) 'ESS' 'CODE'
  17  O 01560007                 LDTM(6) 'LEAD' 'TIME'
  18  O 01570007                 MDR(8) 'MOB DMD' 'RATIO'
  19  O 01580007                 DMDVAL(10) 'MOB DEMAND' 'VALUE'
  20  O 01590007                 AGE(6) 'AGE OF' 'ITEM'/
  21  O 01600007       CTITLE=' '
  22  O 01610013             'IPP PROTOTYPE INDICATOR RESULTS'
  23  O                      '***  DGSC  ***'/
  24  O 01620007       RTITLE=')DATE' 'PAGE )PAGE'/
  25  O 01630007       BREAK=(NOBREAK) (SKIP(0))

REPORT REQUIRES      1780 BYTES FOR THIS TASK
```

APPENDIX C - EXAMPLE OF INDICATOR COMPUTATION

This appendix follows the computation of the planning indicator value for one sample item. The item chosen for this example is managed by the Defense Industrial Supply Center (DISC), specifically NSN 5340001930783 which has the nomenclature "Clamp, Loop". Using our indicator database we determine that this item has the following attribute values:

CIL Application - Yes

Essentiality Code - 1

Lead Time - 271 days

Mob Demand Ratio - 160.0

Mob Demand Value - $146,740

Age of Item - Established

1. Assignment of Numeric Attribute Values

The first step in the computation of an indicator value for this item is the assignment of numeric values for each attribute. We use the following attribute value mapping algorithms:

CIL Application -

No	--->	0.0
Yes	--->	1.0

Essentiality Code -

1	--->	0.0
3	--->	5.5
5	--->	3.5
6	--->	3.5
7	--->	3.5
Blank	--->	5.5

Age of Item Code -

E	--->	1.0
N	--->	2.0
Blank	--->	1.5

Using these mapping algorithms, we translate the CIL application, essentiality code, and age of item attributes to the following numeric values:

CIL Application - 1.0

Essentiality Code - 0.0

Age of Item - 1.0

2. Clip Extreme Attribute Values

The next step is to clip any attribute values which lie outside of the ideal and negative-ideal solutions. This places the following constraints on the attribute values:

0.0 <= CIL Application <= 1.0

0.0 <= Essentiality Code <= 5.5

0 <= Lead Time <= 750

0.0 <= Mob Demand Ratio <= 500.0

0 <= Mob Demand Value <= 100,000

1.0 <= Age of Item <= 2.0

The only attribute which must be clipped in this example is the mobilization demand value attribute since $146,740 is greater than the $100,000 maximum allowed value. This produces the attribute value set of:

CIL Application = 1.0

Essentiality Code = 0.0

Lead Time = 271

Mob Demand Ratio = 166.0

Mob Demand Value = 100,000

Age of Item = 1.0

3. Normalization

The next step requires normalizing each attribute. Normalization makes the highest value of one attribute equivalent (numerically) to the highest value of another attribute. For our normalization, we are mapping the values for each attribute into the range from zero to one. Each attribute is normalized by subtracting any displacement of the minimum value from zero from the attribute value and dividing the value by the range of values (maximum minus minimum). This normalization can be expressed as

NORMALIZED VALUE = (OLD VALUE - MINIMUM) / (MAXIMUM - MINIMUM)

The following computations are performed to normalize our sample item

CIL Application = (1.0 - 0.0) / (1.0 - 0.0) = 1.0

Essentiality Code = (0.0 - 0.0) / (5.5 - 0.0) = 0.0

Lead Time = (271 - 0) / (750 - 0) = 0.361

Mob Demand Ratio = (166.0 - 0.0) / (500.0 - 0.0) = 0.322

Mob Demand Value = (100000 - 0) / (100000 - 0) = 1.0

Age of Item = (1.0 - 1.0) / (2.0 - 1.0) = 0.0

4. Application of Attribute Weights

Next, we multiply the normalized attribute values by their respective attribute weights. The weighting process can be expressed by

WEIGHTED VALUE = NORMALIZED VALUE * WEIGHT

Applying the appropriate attribute weights yields

CIL Application = 1.0 * 37.5 = 37.5

Essentiality Code = 0.0 * 34.4 = 0.0

Lead Time = 0.361 * 12.5 = 4.51

Mob Demand Ratio = 0.332 * 9.4 = 3.12

Mob Demand Value = 1.0 * 3.1 = 3.1

Age of Item = 0.0 * 3.1 = 0.0

5. Compute Distances to Ideal and Negative-Ideal Solutions

After the weighted normalized attribute values have been computed, the Euclidean distances to the ideal and negative-ideal solutions must be computed. The general algorithm to compute the Euclidean distance between two points is

DISTANCE = ((X1 - X2)^2 + (Y1 - Y2)^2 + . . .)^0.5

where X and Y represent two of the dimensions (attributes) which define the coordinate system. First, we apply this algorithm to compute the distance to the ideal solution.

```
Dist(ideal) = ( (  0.0 - 37.5  ) ^ 2  +
              ( 34.4 -  0.0  ) ^ 2  +
              (  0.0 -  4.51 ) ^ 2  +
              (  0.0 -  3.12 ) ^ 2  +
              (  0.0 -  3.10 ) ^ 2  +
              (  0.0 -  0.0  ) ^ 2 ) ^ 0.5  =  51.3
```

The distance to the negative-ideal solution is computed

```
Dist(neg-ideal) = ( ( 37.5 - 37.5  ) ^ 2  +
                  ( 0.0 -  0.0  ) ^ 2  +
                  ( 12.5 -  4.51 ) ^ 2  +
                  ( 9.4 -  3.12 ) ^ 2  +
                  ( 3.1 -  3.10 ) ^ 2  +
                  ( 3.1 -  0.0  ) ^ 2 ) ^ 0.5  =  10.6
```

6. Indicator Computation

Finally, the indicator which expresses the relative closeness of the item to the ideal solution is computed by the formula

```
INDICATOR  =  1.0 - ( Dist(neg-ideal) / ( Dist(neg-ideal) + Dist(ideal) ) )
```

This makes our final computation

```
INDICATOR  =  1.0 - ( 10.6 / ( 10.6 + 51.3 ) ) =  0.828
```

Appendix D

Construction Commodity Indicator Results

IPP PROTOTYPE INDICATOR RESULTS
*** DCSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
4820010828343	VALVE,CHECK		.8735	C	1	570	172.0	298977	E
4730011001694	ADAPTER,SLEEVE		.8734	C	1	354	401.7	149432	E
4730010957032	COUPLING ASSEMBLY,S		.8700	C	1	353	365.0	275298	E
4820010845493	VALVE,CHECK		.8520	C	1	284	329.5	527384	E
4820011008420	VALVE,RELIEF,PRESSU		.8471	C	1	450	146.0	11452	E
2520009298913	PROPELLER SHAFT		.8464	C	1	216	493.3	1558131	E
4730011284598	PLUG,PIPE		.8445	C	1	240	1287.5	798	E
4730003173008	ELBOW,PIPE		.8432	C	1	209	922.8	51677	E
1650010401371	LINE REPAIR ASSEMBL		.8431	C	1	678	14.2	25304	E
1615010957114	CONE,HUB ASSEMBLY		.8413	C	1	580	34.3	62716	E
4820011008404	VALVE,CHECK		.8412	C	1	352	151.0	206690	E
4720002874830	HOSE,AIR DUCT		.8407	C	1	600	50.1	2399	E
3040011019831	CONNECTING LINK,RIG		.8404	C	1	570	45.3	27800	E
2520000402255	SUPPORT,TRANSFER TR		.8402	C	1	462	75.7	109941	E
4720010899049	HOSE,PREFORMED		.8396	C	1	529	43.2	75343	E
3040000030469	LEVER,REMOTE CONTRO		.8394	C	1	671	8.1	47724	E
2930001338173	HOUSING,WATER PUMP		.8388	C	1	310	189.4	589314	E
4710010842264	TUBE ASSEMBLY,METAL		.8373	C	1	690	15.0	3103	E
4710010842263	TUBE ASSEMBLY,METAL		.8370	C	1	810	9.0	1756	E
3040010913846	CONNECTING LINK,RIG		.8365	C	1	720	9.0	1171	E
3020009539909	GEAR,HELICAL		.8355	C	1	630	1.6	41560	E
4710011610686	TUBE ASSEMBLY,METAL		.8350	C	1	833	1.0	0	E
4310004011453	WIRING HARNESS,BRAN		.8350	C	1	810	1.0	0	E
4710010956962	TUBE ASSEMBLY,METAL		.8341	C	1	600	21.0	593	E
4710008831329	TUBE ASSEMBLY,METAL		.8336	C	1	600	19.0	525	E

IPP PROTOTYPE INDICATOR RESULTS
*** DCSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
4730010956972	ELBOW,FUEL LINE		.8331	C	1	600	12.0	9324	E
4730002751431	CLAMP,HOSE		.8326	C	1	664	0.0	0	E
4710012208407	TUBE ASSEMBLY,METAL		.8325	C	1	551	1.0	0	N
2910009070673	TAPPET,FUEL INJECTI		.8324	C	1	660	0.0	0	E
2990011254000	GEAR,DRIVE,GOVERNOR		.8320	C	1	301	169.0	46167	E
2910008715432	CAMSHAFT,FUEL INJEC		.8313	C	1	635	0.0	0	E
4710011429815	TUBE ASSEMBLY,METAL		.8311	C	1	630	0.0	0	E
2530004035718	SHAFT AND BEARING A		.8310	C	1	204	313.1	33567	E
3040000042940	CONNECTING LINK,RIG		.8306	C	1	620	.2	228	E
4710011153985	TUBE ASSEMBLY,METAL		.8298	C	1	600	1.7	540	E
1615010957076	SUPPORT ASSEMBLY,TA		.8296	C	1	600	1.0	0	E
3040010624054	CONNECTING LINK,RIG		.8296	C	1	600	1.0	0	E
1615010919847	HOUSING,BEARING SUP		.8294	C	1	600	0.0	0	E
3995010921804	GUIDE,CABLE,DRIVER		.8293	C	1	595	1.0	0	E
1730003117555	DRIVING ROD ASSY,AC		.8293	C	1	510	31.0	1254	E
1730003315660	HOUSING ASSEMBLY,LO		.8293	C	1	598	0.0	0	E
1005004102182	FLIPPER,CANISTER		.8292	C	1	284	186.6	1343	E
1650009740004	RETAINER,BEARING		.8290	C	1	510	1.0	0	N
4710010452191	TUBE ASSEMBLY,METAL		.8289	C	1	593	0.0	0	E
4710011289386	TUBE ASSEMBLY,METAL		.8288	C	1	567	1.0	0	E
3010011284676	DRIVE UNIT,ANGLE		.8282	C	1	581	0.0	0	E
3040011187545	CONNECTING LINK,RIG		.8278	C	1	575	0.0	0	E
4710011400310	TUBE ASSEMBLY,METAL		.8278	C	1	573	1.0	0	E
4710011281521	TUBE ASSEMBLY,METAL		.8277	C	1	571	1.0	0	E
4320004509657	FILTER,HYDRAULIC		.8276	C	1	570	1.0	0	E

IPP PROTOTYPE INDICATOR RESULTS
*** DCSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
4710011146842	TUBE ASSEMBLY,METAL		.8271	C	1	540	9.0	202	E
4710011284738	TUBE ASSEMBLY,METAL		.8271	C	1	562	1.0	0	E
4440011454285	DEHYDRATOR UNIT,NON		.8270	C	1	564	0.0	0	E
1650005737034	LATCH,ARRESTING HOO		.8268	C	1	503	20.0	4868	E
4710011295673	TUBE ASSEMBLY,METAL		.8266	C	1	555	1.0	0	E
2920009234700	VALVE,FUEL		.8262	C	1	480	1.0	0	N
4820010069636	STOP,VALVE		.8261	C	1	222	263.0	326	E
4710010314029	TUBE ASSEMBLY,METAL		.8261	C	1	552	0.0	0	E
3040009712852	CONNECTING LINK,RIG		.8260	C	1	550	0.0	0	E
1730011051463	PPORT ASSEMBLY,CR		.8258	C	1	510	9.0	10695	E
4710011284338	TUBE ASSEMBLY,METAL		.8258	C	1	545	1.0	0	E
4710011291982	TUBE ASSEMBLY,METAL		.8256	C	1	542	1.0	0	E
2510007409337	SHACKLE,LEAF SPRING		.8255	C	1	456	14.0	61536	E
4310004011448	SHAFT AND ELEMENT A		.8254	C	1	540	1.0	0	E
1620011076655	ADAPTER,MOUNT,POWER		.8252	C	1	540	0.0	0	E
1620011146135	ADAPTER,TAIL LANDIN		.8251	C	1	480	22.3	4252	E
3040011303763	CONNECTING LINK,RIG		.8247	C	1	430	36.0	26415	E
4730000234888	REDUCER,TUBE		.8243	C	1	528	.2	22	E
4820011546433	VALVE,SHUTOFF FUEL		.8241	C	1	485	.8	25515	E
3040003253251	CONNECTING LINK,RIG		.8240	C	1	525	0.0	0	E
1650011026044	FITTING,HYDRAULIC		.8240	C	1	390	71.0	274	E
4710011026079	TUBE ASSEMBLY,METAL		.8239	C	1	450	34.0	538	E
1650002552923	COUPLING,HANGER,TAI		.8237	C	1	453	4.5	76216	E
4710011284337	TUBE ASSEMBLY,METAL		.8237	C	1	519	1.0	0	E
3040011289334	CONNECTING LINK,RIG		.8236	C	1	518	1.0	0	E

IPP PROTOTYPE INDICATOR RESULTS
*** DCSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD R&TIO	MOB DEMAND VALUE	AGE OF ITEM
4730008320789	ELBOW,FLANGE TO HOS		.8235	C	1	519	0.0	0	E
1650009712776	PARTS KIT,LINEAR AC		.8234	C	1	502	6.3	403	E
4710011479365	TUBE ASSEMBLY,METAL		.8233	C	1	514	1.0	0	E
1730003374656	LEVER ASSEMBLY,LOCK		.8233	C	1	516	.1	506	E
3040012289265	GEARSHAFT,SPUR		.8231	C	1	450	1.0	0	N
4720010407217	HOSE ASSEMBLY,NONME		.8231	C	1	450	1.0	0	N
3040012387080	CONNECTING LINK,RIG		.8231	C	1	450	1.0	0	N
4730012025795	COUPLING ASSEMBLY,T		.8231	C	1	450	1.0	0	N
3040002950673	CONNECTING LINK,RIG		.8231	C	1	514	0.0	0	E
3020012317123	GEAR,SPUR		.8231	C	1	450	1.0	0	N
4730012429975	CAP,QUICK DISCONNEC		.8231	C	1	450	1.0	0	N
4720010171264	HOSE ASSEMBLY,NONME		.8229	C	1	510	1.0	0	E
4820004040768	VALVE,RELIEF		.8229	C	1	510	1.0	0	E
4720010171266	HOSE ASSEMBLY,NONME		.8229	C	1	510	1.0	0	E
4310004011450	PUMP ASSY,OIL		.8229	C	1	510	1.0	0	E
4710011497988	TUBE ASSEMBLY,METAL		.8229	C	1	512	0.0	0	E
3895002526896	REELING MACHINE,CAB		.8228	C	1	511	0.0	0	E
2815001779239	HOUSING ASSEMBLY		.8227	C	1	510	0.0	0	E
2930006086308	REGULATOR ASSEMBLY,		.8226	C	1	489	.6	15148	E
3040002959268	CONNECTING LINK,RIG		.8224	C	1	506	0.0	0	E
3040011586052	CONNECTING LINK,RIG		.8223	C	1	455	21.0	4981	E
3020009729400	GEAR,SPUR		.8220	C	1	335	99.0	4881	E
3040010854224	CONNECTING LINK,RIG		.8220	C	1	394	40.0	35625	E
4710011051502	TUBE ASSEMBLY,METAL		.8219	C	1	480	9.0	184	E
4710011056616	TUBE,METALLIC		.8219	C	1	480	9.0	276	E

Appendix E

Electronics Commodity Indicator Results

IPP PROTOTYPE INDICATOR RESULTS
*** DESC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
5961007585816	TRANSISTOR		.8921	C	1	576	252.5	220654	E
1650010957306	SHAFT ASSEMBLY,DUCT		.8532	C	1	630	79.0	37816	E
5961005569314	SEMICONDUCTOR DEVIC		.8519	C	1	275	557.0	1928	E
5998011935737	CONTACT,ELECTRICAL		.8519	C	1	233	472.0	15548	N
5961000688243	SEMICONDUCTOR DEVIC		.8438	C	1	778	35.5	5978	E
5985011263124	SELECTOR,ANTENNA		.8432	C	1	850	7.8	923202	E
5821010661613	ELECTRONIC COMPONEN		.8419	C	1	863	2.4	104347	E
5855010392855	LENS,OBJECTIVE,NIGH		.8404	C	1	630	25.9	32752	E
1440006292471	LUG ASSEMBLY,SUSPEN		.8403	C	1	690	1.0	0	N
1430006097603	CABLE ASSEMBLY,POWE		.8392	C	1	650	1.0	0	N
5990009135159	SYNCHRO,RECEIVER		.8377	C	1	643	.7	70226	E
1430010073815	SHAFT,RESOLVER		.8360	C	1	600	1.0	0	N
1430010084037	NUT,BEARING		.8360	C	1	600	1.0	0	N
1430010085217	OSCILLATOR-BORESIGH		.8360	C	1	600	1.0	0	N
5999011341357	CONNECTOR-SWITCH		.8356	C	1	697	.1	15842	E
5999011122943	CONTACT		.8356	C	1	600	27.5	1001	E
5930001477632	SWITCH,ROTARY		.8355	C	1	555	40.8	3324	E
5962011130831	MICROCIRCUIT,LINEAR		.8355	C	1	818	1.0	4459	E
1440004418780	HANDLE ASSEMBLY,RIG		.8350	C	1	810	1.0	0	E
5961003160246	TRANSISTOR		.8350	C	1	810	1.0	0	E
5910001172630	CAPACITOR,FIXED,MET		.8350	C	1	810	1.0	0	E
5962010716438	MICROCIRCUIT,LINEAR		.8350	C	1	750	1.0	0	E
5910001258778	CAPACITOR,FIXED,ELE		.8350	C	1	810	1.0	0	E
5962010716443	MICROCIRCUIT,LINEAR		.8348	C	1	840	0.0	0	E
5895003606529	DIPLEXER		.8348	C	1	749	0.0	0	E

IPP PROTOTYPE INDICATOR RESULTS
*** DESC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
5962011192964	MICROCIRCUIT,LINEAR		.8348	C	1	755	0.0	0	E
5910011374211	CAPACITOR,FIXED,ELE		.8348	C	1	779	.3	16	E
5935011815681	ADAPTER,CONNECTOR		.8345	C	1	578	1.0	0	N
5945007733392	RELAY,ELECTROMAGNET		.8344	C	1	600	1.1	51421	E
5930011401618	SWITCH,PROXIMITY		.8343	C	1	720	0.0	0	E
5962003242195	MICROCIRCUIT,DIGITA		.8341	C	1	710	0.0	0	E
1430011049695	CABLE		.8340	C	1	570	1.0	0	N
1430010644935	CABLE ASSEMBLY		.8340	C	1	570	1.0	0	N
1430008027542	CAVITY,TUNED		.8340	C	1	570	1.0	0	N
5935010320156	CONNECTOR,ELECTRICA		.8338	C	1	698	.3	206	E
5930006831526	SWITCH,PRESSURE		.8337	C	1	697	0.0	0	E
5915009290846	NETWORK,PHASE CHANG		.8333	C	1	682	0.0	0	E
5935003483774	COVER,ELECTRICAL CO		.8332	C	1	630	8.9	986	E
1440004134364	CIRCUIT CARD ASSEMB		.8332	C	1	625	1.0	20055	E
5962003655728	MICROCIRCUIT,DIGITA		.8332	C	1	678	0.0	887	E
5985002742265	ANTENNA		.8331	C	1	560	.5	262820	E
5930010611661	ADAPTER,SWITCH ACTU		.8331	C	1	480	64.0	183	E
5930011335707	SWITCH,PUSH		.8329	C	1	666	1.0	0	E
5855010631612	CIRCUIT CARD ASSEMB		.8327	C	1	660	1.0	0	E
4935008335004	CABLE ASSEMBLY,SPEC		.8327	C	1	660	1.0	0	E
5960002620210	ELECTRON TUBE		.8326	C	1	636	.1	10523	E
5920000224498	FUSE,CARTRIDGE		.8325	C	1	662	0.0	0	E
5935003658429	CONNECTOR,PLUG,ELEC		.8325	C	1	657	1.0	0	E
5962011425116	MICROCIRCUIT,DIGITA		.8323	C	1	657	0.0	0	E
5965010178741	ADAPTER,HEADSET-MIC		.8322	C	1	600	.6	24857	E

IPP PROTOTYPE INDICATOR RESULTS
*** DESC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
5962011307587	MICROCIRCUIT,LINEAR		.8322	C	1	655	0.0	0	E
5905007878665	RESISTOR,VARIABLE,N		.8320	C	1	650	0.0	0	E
5961008920918	SEMICONDUCTOR DEVIC		.8319	C	1	639	1.8	128	E
5930011627316	SWITCH,PUSH		.8317	C	1	577	.6	36722	E
1430008750732	ATTENUATOR,VARIABLE		.8314	C	1	540	0.0	0	N
5955010716309	OSCILLATOR,NONCRYST		.8313	C	1	630	1.0	0	E
5985010561088	DUMMY LOAD,ELECTRIC		.8313	C	1	630	1.0	0	E
5895010558985	ELECTRONIC COMPONEN		.8313	C	1	630	1.0	0	E
5962011475793	MICROCIRCUIT,DIGITA		.8313	C	1	634	0.0	0	E
5962011790537	MICROCIRCUIT,DIGITA		.8312	C	1	629	1.0	0	E
5962011803923	MICROCIRCUIT,DIGITA		.8312	C	1	535	1.0	0	N
5950010703921	TRANSFORMER,PULSE		.8311	C	1	630	0.0	0	E
1440004622501	CABLE ASSEMBLY,SPEC		.8311	C	1	630	0.0	0	E
5895010729399	CABLE ASSEMBLY,BELT		.8311	C	1	630	0.0	0	E
1420001272917	SYNCHRONOUS FILTER		.8311	C	1	630	0.0	0	E
5950007709109	COIL,ELECTRICAL		.8310	C	1	628	0.0	0	E
5962005393581	HYBRID ASSEMBLY		.8310	C	1	624	1.0	0	E
5935011283712	CONNECTOR,RECEPTACL		.8309	C	1	627	0.0	0	E
5945009989113	RELAY,ELECTROMAGNET		.8309	C	1	600	.6	12090	E
5945010990978	RELAY,ELECTROMAGNET		.8307	C	1	350	103.7	36879	E
5961009136407			.8306	C	1	621	0.0	0	E
5999000313729	CONTACT,ELECTRICAL		.8305	C	1	600	4.8	669	E
5962011927520	MICROCIRCUIT,DIGITA		.8304	C	1	528	0.0	0	N
1440008769323	CIRCUIT CARD ASSEMB		.8303	C	1	579	1.1	18260	E
5962011784364	MICROCIRCUIT,LINEAR		.8302	C	1	610	1.0	0	E

IPP PROTOTYPE INDICATOR RESULTS
*** DESC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
5985004040409	PROBE,WAVEGUIDE		.8301	C	1	600	.1	5983	E
5961006155550	SEMICONDUCTOR DEVIC		.8300	C	1	610	0.0	0	E
5985004183813	ATTENUATOR,VARIABLE		.8300	C	1	610	0.0	0	E
5961008551551	TRANSISTOR		.8300	C	1	611	0.0	0	E
5945007525599	FLASHER,THERMAL		.8298	C	1	600	0.0	3108	E
5962011284659	MICROCIRCUIT,DIGITA		.8297	C	1	606	0.0	0	E
5915000000148	FILTER,BAND PASS		.8296	C	1	600	1.0	0	E
5910001754709	CAPACITOR,FIXED,PLA		.8296	C	1	600	1.0	0	E
5930011683310	SWITCH,SENSITIVE		.8295	C	1	513	6.6	52475	E
5915010285857	FILTER,BAND PASS		.8295	C	1	599	1.0	0	E
5945002255622	ARMATURE,ELECTROMAG		.8295	C	1	600	0.0	1154	E
5962010266035	MICROCIRCUIT,LINEAR		.8294	C	1	600	0.0	0	E
5855001316338	RING,RETAINING,OPTI		.8294	C	1	600	0.0	0	E
5905006792344	RESISTOR,VARIABLE,W		.8294	C	1	600	0.0	0	E
5962011121357	MICROCIRCUIT,DIGITA		.8294	C	1	600	0.0	0	E
5945011289460	RELAY,HYBRID		.8294	C	1	600	0.0	0	E
5961009475714	SEMICONDUCTOR DEVIC		.8294	C	1	601	0.0	0	E
5950000988925	TRANSFORMER,POWER		.8294	C	1	600	0.0	0	E
5985004445289	WAVEGUIDE ASSEMBLY		.8293	C	1	598	0.0	0	E
5962011793616	MICROCIRCUIT,DIGITA		.8292	C	1	593	1.0	0	E
5950011752875	TRANSFORMER,RADIO F		.8290	C	1	510	1.0	0	N
1440006292512	TUBE,EXTENSION		.8288	C	1	510	0.	0	N
5950000193007	TRANSFORMER,POWER		.8288	C	1	590	0.0	0	E
5962005394049	HYBRID ASSEMBLY		.8288	C	1	588	1.0	0	E
5930010137255	SWITCH,PRESSURE		.8287	C	1	588	0.0	873	E

Appendix F

General Commodity Indicator Results

IPP PROTOTYPE INDICATOR RESULTS
*** DGSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
6680010826788	TRANSMITTER,LIQUID		.8821	C	1	513	245.5	180830	E
1055011068601	FILTER ASSEMBLY		.8430	C	1	680	17.0	68255	E
6680005738137	TRANSMITTER,LIQUID		.8421	C	1	818	4.1	82734	E
5975006026684	COUPLING,ELECTRICAL		.8396	C	1	683	25.6	4196	E
5940004454755	TERMINAL BOARD		.8388	C	1	209	611.0	6153	E
6680005738139	TRANSMITTER,LIQUID		.8375	C	1	610	6.9	76218	E
5940001771975	TERMINAL,TAPER PIN,		.8368	C	1	171	3896.0	1052	N
6615011585747	LINK ASSEMBLY		.8359	C	1	573	11.9	68971	E
6150003294502	LEAD,ELECTRICAL		.8356	C	1	249	305.5	489	E
5240011387519	LAMP,FLASHTUBE		.8350	C	1	900	1.0	0	E
5995010716346	CABLE ASSEMBLY,RADI		.8350	C	1	960	1.0	0	E
6680000886678	INDICATOR,LIQUID QU		.8350	C	1	595	1.8	65177	E
5995010716348	CABLE ASSEMBLY,RADI		.8350	C	1	960	1.0	0	E
5995010716350	CABLE ASSEMBLY,RADI		.8350	C	1	870	1.0	0	E
5995010720525	CABLE ASSEMBLY,RADI		.8350	C	1	900	1.0	0	E
5995010716339	CABLE ASSEMBLY,RADI		.8350	C	1	930	1.0	0	E
5995010716341	CABLE ASSEMBLY,RADI		.8350	C	1	960	1.0	0	E
5995010716342	CABLE ASSEMBLY,RADI		.8350	C	1	960	1.0	0	E
6110004209026	AMPLIFIER,ELECTRONI		.8347	C	1	745	0.0	0	E
6105007882875	MOTOR,DIRECT CURREN		.8345	C	1	730	0.0	0	E
6105011140144	MOTOR,DIRECT CURREN		.8343	C	1	389	93.0	271778	E
4130010523739	FILTER ELEMENT,AIR		.8313	C	1	630	1.0	0	E
6105008666094	STATOR,MOTOR		.8313	C	1	634	0.0	0	E
6620008303554	TRANSMITTER,PRESSUR		.8295	C	1	520	.3	82806	E
6680011233237	TRANSMITTER,LIQUID		.8292	C	1	511	1.3	133258	E

IPP PROTOTYPE INDICATOR RESULTS
*** DGSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
6115007651525	SHAFT ASSEMBLY,DRIV		.8291	C	1	595	0.0	0	E
6350010500265	ANNUNCIATOR		.8289	C	1	583	.6	3706	E
4140006847213	FAN,CENTRIFUGAL		.8288	C	1	590	0.0	0	E
6115009411655	COVER,GENERATOR SET		.8280	C	1	579	0.0	0	E
4[illegible]011400197	AIR SWITCH ASSEMBLY		.8274	C	1	569	0.0	0	E
9330001139438	PLASTIC SHEET		.8273	C	1	490	1.5	113021	E
4140007[illegible]88790	FAN,VANEAXIAL		.8264	C	1	556	0.0	0	E
1055[illegible]1256085	SHAFT,OUTPUT		.8262	C	1	480	1.0	0	N
6105006473646	MOTOR,ALTERNATING C		.8261	C	1	552	0.0	0	E
5940002571263	TERMINAL,LUG		.8259	C	1	195	251.9	119882	E
6680011382976	TRANSMITTER,LIQUID		.8254	C	1	543	0.0	0	E
6680011672962	TRANSMITTER,LIQUID		.8254	C	1	530	.7	7203	E
5970011216591	INSULATOR,PLATE		.8251	C	1	536	1.0	0	E
5995010522477	CABLE ASSEMBLY,SPEC		.8246	C	1	530	1.0	0	E
5995011555953	CABLE ASSEMBLY,RADI		.8245	C	1	529	1.0	0	E
9320012393772	RUBBER SHEET,CELLUL		.8243	C	1	463	0.0	0	N
6645012282011	METER,TIME TOTALIZI		.8241	C	1	459	1.0	0	N
5995011555954	CABLE ASSEMBLY,RADI		.8239	C	1	521	1.0	0	E
668001[illegible]3880	TRANSMITTER,LIQUID		.8237	C	1	518	.3	1751	E
6130011546958	POWER SUPPLY		.8236	C	1	520	0.0	0	E
6680011235116	TRANSMITTER,LIQUID		.8235	C	1	519	0.0	0	E
6150010424318	LEAD,ELECTRICAL		.8234	C	1	515	1.0	0	E
6680011608582	TRANSMITTER,LIQUID		.8233	C	1	517	0.0	0	E
6680011658578	TRANSMITTER,LIQUID		.8230	C	1	517	0.0	0	E
6680011772768	TRANSMITTER,LIQUID		.8232	C	1	516	0.0	0	E

IPP PROTOTYPE INDICATOR RESULTS
*** DGSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
1055011191371	DISK,CLUTCH		.8231	C	1	450	1.0	0	N
5940012460297	TERMINAL JUNCTION B		.8231	C	1	450	1.0	0	N
5975012222087	CONDUIT ASSEMBLY,NO		.8231	C	1	450	1.0	0	N
6635011789154	VECTORMETER		.8231	C	1	450	1.0	0	N
6105011923049	MOTOR,ALTERNATING C		.8231	C	1	450	1.0	0	N
5940012462194	TERMINAL JUNCTION B		.8231	C	1	450	1.0	0	N
5970011950065	INSULATOR,BUSHING		.8231	C	1	450	1.0	0	N
5970011951558	INSULATOR,PLATE		.8231	C	1	450	1.0	0	N
5995010955279	CABLE ASSEMBLY,SPEC		.8230	C	1	450	.2	105996	E
6610006030264	PLATE,PIVOT ARM		.8229	C	1	510	1.0	0	E
5970012504737	INSULATOR,BUSHING		.8229	C	1	450	0.0	0	N
6220009477570	LIGHT,WARNING		.8229	C	1	512	0.0	0	E
5970012504736	INSULATOR,BUSHING		.8229	C	1	450	0.0	0	N
5995011555952	CABLE ASSEMBLY,RADI		.8227	C	1	507	1.0	0	E
5995011558393	CABLE ASSEMBLY,RADI		.8226	C	1	506	1.0	0	E
6685011272589	SENSOR,TEMPERATURE		.8225	C	1	500	.1	5700	E
6680011382974	TRANSMITTER,LIQUID		.8224	C	1	506	0.0	0	E
5975011014075	JUNCTION BOX,ASSEMB		.8221	C	1	480	9.0	2457	E
6685011179517	SENSOR,TEMPERATURE		.8220	C	1	502	0.0	0	E
6680011382975	TRANSMITTER,LIQUID		.8220	C	1	500	0.0	1214	E
6140004062634	BATTERY,STORAGE	P	.8219	C	1	501	0.0	0	E
5970011247275	INSULATOR,STANDOFF		.8218	C	1	438	1.0	0	N
6680011668878	TRANSMITTER,LIQUID		.8217	C	1	498	0.0	0	E
6680011235117	TRANSMITTER,LIQUID		.8214	C	1	495	0.0	0	E
5995010882525	CABLE ASSEMBLY,RADI		.8212	C	1	490	1.0	0	E

IPP PROTOTYPE INDICATOR RESULTS
*** DGSC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
6130010391975	POWER SUPPLY	P	.8211	C	1	473	5.5	5998	E
5995011555951	CABLE ASSEMBLY,RADI		.8211	C	1	489	1.0	0	E
9320011579070	RUBBER SHEET,SOLID		.8207	C	1	279	142.0	6589	E
6685010588880	SENSOR,TEMPERATURE		.8207	C	1	485	1.0	0	E
6675010663253	ALIDADE,SURVEYING		.8205	C	1	485	0.0	0	E
5975012015309	PANEL,BLANK		.8204	C	1	425	1.0	0	N
5970004494900	INSULATOR,WASHER		.8203	C	1	483	0.0	0	E
5995010882922	CABLE ASSEMBLY,RADI		.8203	C	1	481	1.0	0	E
5610006030032	CAGING LEVER ASSEMB		.8202	C	1	480	1.0	0	E
4140004721739	FAN,TUBEAXIAL		.8201	C	1	481	0.0	0	E
5355010382208	KNOB		.8200	C	1	480	0.0	0	E
5970011937625	INSULATOR,BUSHING		.8198	C	1	420	1.0	0	N
5920000906982	CABLE ASSEMBLY,SPEC		.8196	C	1	420	0.0	0	N
6150012486300	LEAD ASSEMBLY,ELECT		.8196	C	1	420	0.0	0	N
5940012502498	TERMINAL,STUD		.8196	C	1	420	0.0	0	N
6150012487190	LEAD ASSEMBLY,ELECT		.8196	C	1	420	0.0	0	N
5977008764054	BRUSH,ELECTRICAL CO		.8190	C	1	469	0.0	0	E
5940009836125	TERMINAL BOARD		.8187	C	1	450	8.0	23	E
5977008764052	BRUSH,ELECTRICAL CO		.8187	C	1	466	0.0	0	E
5970010683455	INSULATOR,WASHER		.8184	C	1	463	0.0	0	E
5970011143800	INSULATOR,PLATE		.8184	C	1	420	23.0	120	E
6680007042232	POTOR ASSY		.8183	C	1	366	52.5	7113	E
5940010897650	TERMINAL BOARD		.8183	C	1	450	1.0	0	E
6680011275217	TRANSMITTER,LIQUID		.8183	C	1	462	0.0	0	E
6685003003653	GAGE ASSEMBLY,AIR P		.8182	C	1	461	0.0	494	E

Appendix G

Industrial Commodity Indicator Results

IPP PROTOTYPE INDICATOR RESULTS
*** DISC ***

NSN	LIC NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
5306011161199	BOLT,CLOSE TOLERANC		.8999	C	1	578	335.0	19477	E
1680010927979	CAPSULE ASSEMBLY,FL		.8924	C	1	445	394.0	717632	E
3110010064014	BEARING,BALL,ROD EN		.8787	C	1	360	888.4	176544	E
3110010102481	BEARING,BALL,AIRFRA		.8757	C	1	550	232.0	7730	E
3110011456998	BEARING,BALL,AIRFRA		.8704	C	1	360	458.0	12705	E
5310005268932	WASHER,FLAT		.8693	C	1	339	391.7	170794	E
3120012129307	BEARING,SLEEVE		.8676	C	1	390	283.0	611	N
3110011531392	BEARING,ROLLER,NEED		.8662	C	1	340	572.2	7027	E
5320007618454	RIVET,SOLID		.8644	C	1	300	500.9	71320	E
5340011594776	CLEVIS,ROD END		.8618	C	1	420	255.0	12712	E
5340004904134	ARM,ADJUSTING,GENER		.8593	C	1	299	666.3	18563	E
5310011246463	WASHER,FLAT		.8508	C	1	270	707.7	1529	E
5330012211034	RUBBER STRIP		.8480	C	1	224	478.0	641	N
5310009732654	WASHER,SPRING TENSI		.8471	C	1	332	218.2	215598	E
5305008540538	SCREW,CAP,SOCKET HE		.8458	C	1	293	323.5	595	E
5330007639322	GASKET		.8452	C	1	210	516.2	290701	E
1560010826493	TAIL PIPE ASSY		.8447	C	1	660	24.0	101009	E
5305006911789	SCREW,MACHINE		.8436	C	1	284	256.4	655324	E
6145010112264	WIRE,ELECTRICAL		.8434	C	1	235	2390.0	143	E
1680011594616	ROD END ASSEMBLY,FL		.8431	C	1	390	161.0	25940	E
5306011014163	BOLT,EYE		.8426	C	1	590	63.0	439	E
1560011580873	BLADE,CUTTER ASSY		.8426	C	1	660	15.0	72	N
1560011580865	BLADE,CUTTER ASSY		.8426	C	1	660	15.0	72	N
5305002086431	SCREW,MACHINE		.8424	C	1	360	194.1	12420	E
1560011101442	WINDOW SUB-ASSEMBLY		.8408	C	1	510	54.5	117500	E

IPP PROTOTYPE INDICATOR RESULTS
*** DISC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
1560010894425	FITTING ASSEMBLY,CO		.8403	C	1	660	33.0	3672	E
5305009789372	SCREW,CAP,SOCKET HE		.8396	C	1	300	214.3	60856	E
1560004222431	FITTING,UPPER		.8386	C	1	870	16.0	1908	E
1680007947702	VALVE,RELIEF		.8381	C	1	564	23.5	74554	E
5310009460871	NUT,PLAIN,HEXAGON		.8380	C	1	203	614.1	9826	E
1560011003571	CAP AND ADAPTER ASS		.8380	C	1	720	15.0	2724	E
3110010070187	BEARING,ROLLER,CYLI		.8379	C	1	630	1.6	97170	E
1560010957150	RING,SEGMENT,AIR IN		.8378	C	1	870	9.0	8364	E
5305009788359	SCREW,CAP,SOCKET HE		.8372	C	1	213	327.8	250414	E
1560000758253	FAIRING ASSEMBLY,HI		.8372	C	1	651	8.3	30421	E
156001 :149246	HOUSING ASSEMBLY		.8370	C	1	900	8.5	2649	E
5320009572493	RIVET,BLIND		.8369	C	1	171	2457.0	1450	N
5340011854560	BRACKET,ANGLE		.8369	C	1	202	542.0	2894	E
1560011569230	LUG,SUSPENSION		.8363	C	1	658	1.9	33925	E
1560010945526	HANDLE ASSEMBLY,CRE		.8360	C	1	720	6.8	1689	E
1560010820680	FITTING ASSEMBLY,CR		.8360	C	1	900	5.0	570	E
5340008288802	STRAP,RETAINING		.8353	C	1	488	40.8	80444	E
3120011326652	BEARING,PLAIN,ROD E		.8352	C	1	627	.3	43247	E
5365010449047	BUSHING,MACHINE THR		.8350	C	1	855	1.0	0	E
5305010718374	SCREW,MACHINE		.8350	C	1	810	1.0	0	E
5360004418765	SPRING,HELICAL,COMP		.8350	C	1	810	1.0	0	E
3130010714437	CAP,PILLOW BLOCK		.8350	C	1	870	1.0	0	E
3120010696920	BEARING,SLEEVE		.8350	C	1	870	1.0	0	E
3120010745762	BEARING,WASHER,THRU		.8350	C	1	870	1.0	0	E
5330010717932	GASKET		.8348	C	1	900	0.0	0	E

IPP PROTOTYPE INDICATOR RESULTS
*** DISC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
5306009483240	BOLT,EXTERNALLY REL		.8348	C	1	839	0.0	0	E
2995010075415	COVER,BEARING		.8348	C	1	785	0.0	0	E
3120010716446	BUSHING HALF,SLEEVE		.8348	C	1	900	0.0	0	E
1560011506666	BOLT ASSEMBLY,SPECI		.8348	C	1	780	0.0	0	E
5306003859192	BOLT,INTERNALLY REL		.8348	C	1	855	0.0	0	E
1560010957148	MOUNTING,BRACKET		.8348	C	1	840	0.0	0	E
3120010746219	BEARING,SPLIT RACE		.8348	C	1	870	0.0	0	E
1560004540238	BEAM ASSY,WALKING		.8348	C	1	870	0.0	0	E
4010011328718	WIRE ROPE ASSEMBLY,		.8348	C	1	774	0.0	0	E
3110010945134	BEARING,ROLLER,AIRF		.8342	C	1	331	140.2	454167	E
1560010965379	LENS,PANEL ASSEMBLY		.8342	C	1	630	14.0	292	E
5305011325278	SETSCREW		.8340	C	1	697	1.0	0	E
5330011263051	SEAL,ASSEMBLY		.8340	C	1	706	0.0	0	E
1560011061849	FITTING ASSEMBLY,PY		.8340	C	1	690	2.3	150	E
5305008114067	SCREW,CLOSE TOLERAN		.8339	C	1	188	351.2	488906	E
1560000772204	COVER ASSY		.8337	C	1	696	0.0	0	E
5306006378722	BOLT,MACHINE		.8334	C	1	683	.4	331	E
5315011316920	PIN,STRAIGHT,HEADED		.8334	C	1	679	1.0	0	E
1560010957164	FAIRING ASSEMBLY		.8332	C	1	630	9.0	1290	E
5315011128113	PIN,SHOULDER,HEADLE		.8331	C	1	670	1.0	0	E
1680003230687	HOUSING AND PLUNGER		.8331	C	1	609	8.3	12040	E
5340011090698	BUMPER,PLASTIC		.8327	C	1	667	0.0	0	E
1680010631274	BELL CRANK		.8327	C	1	660	1.0	0	E
1680001466982	HOUSING SUBASSY		.8327	C	1	592	9.5	15116	E
1560011142131	RING,DRAG STRUT		.8324	C	1	600	13.5	818	E

IPP PROTOTYPE INDICATOR RESULTS
*** DISC ***

NSN	ITEM NAME	PLAN CODE	INDCTR VALUE	SRC CODE	ESS CODE	LEAD TIME	MOB DMD RATIO	MOB DEMAND VALUE	AGE OF ITEM
5360011290926	SPRING,HELICAL,EXTE		.8323	C	1	651	1.0	0	E
1680001034434	HOUSING ASSEMBLY,ST		.8323	C	1	580	6.7	25942	E
5340011208344	CLEVIS,ROD END		.8322	C	1	655	0.0	0	E
5305005291728	SETSCREW		.8322	C	1	180	776.0	978	E
1560011025998	DETENT ASSEMBLY		.8322	C	1	570	21.0	1659	E
1560010871676	HANDLE ASSY,LH		.8321	C	1	630	4.5	556	E
3120010974978	BUSHING,SLEEVE		.8320	C	1	630	4.0	269	E
5310010600102	NUT,SELF-LOCKING,RO		.8320	C	1	650	0.0	0	E
1560011554600	BRACKET,RIGGING PIN		.8320	C	1	248	267.0	5596	E
5315011600407	PIN,SHOULDER,HEADLE		.8319	C	1	648	0.0	0	E
1560000772182	DUCT ASSEMBLY		.8319	C	1	648	0.0	0	E
3120011211793	BUSHING,SLEEVE		.8317	C	1	638	1.0	0	E
3120004124644	BEARING,PLAIN,SELF-		.8315	C	1	538	1.0	0	N
5315011082655	PIN,SHOULDER,HEADED		.8315	C	1	635	1.0	0	E
1560011055777	PLATE ASSEMBLY		.8314	C	1	600	9.0	279	E
1560011014067	COLLAR ASSEMBLY,TIE		.8314	C	1	420	59.0	85503	E
5315011308564	PIN,STRAIGHT,HEADLE		.8313	C	1	631	1.0	0	E
3110002750110	BEARING,ROLLER,AIRF		.8311	C	1	595	5.5	7029	E
1560002387016	WINDSHIELD PANEL,AI		.8310	C	1	539	2.2	66381	E
5340011161316	CLAMP,BLOCK		.8309	C	1	627	0.0	0	E
5306003274845	BOLT,ALIGHTING GEAR		.8306	C	1	375	84.0	133398	E
5306009372295	BOLT,EXTERNALLY REL		.8304	C	1	617	0.0	0	E
5330008693639	PACKING,PREFORMED		.8301	C	1	607	1.2	41	E
5306008540583	BOLT,MACHINE		.8301	C	1	612	.1	68	E
5305008247362	SCREW,MACHINE		.8301	C	1	175	336.0	366870	E